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ARRANGEMENT FOR SEARCHING PACKET POLICIES  
USING MULTI-KEY HASH SEARCHES IN A NETWORK  
SWITCH

## ABSTRACT OF THE DISCLOSURE

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A network switch, configured for performing layer 2 and layer 3 switching in an Ethernet (IEEE 802.3) network without blocking of incoming data packets, includes network switch ports, each including a flow module configured for generating a packet signature based on layer 3 information within a received data packet. The flow module generates first and second hash keys according to a prescribed hashing function upon obtaining first and second portions of layer 3 information, for example any two of IP source or destination address, transmission control protocol (TCP) source or destination port, or user datagram protocol (UDP) source or destination port. The flow module combines the first and second hash keys to form the packet signature, and searches an on-chip signature table that indexes addresses of layer 3 switching entries by entry signatures, where the entry signatures are generated using the same prescribed hashing function on the first and second layer 3 portions of the layer 3 switching entries. Hence, each network switch port can search for layer 3 switching information in real time as the data packet is received, enabling layer 3 switching logic within the network switch to execute the necessary layer 3 switching decision for the data packet based on the corresponding layer 3 switching entry identified by the network switch port.